

SR 101L to McDowell Road GRAND AVENUE MAJOR INVESTMENT STUDY PHASE II



February 2006

EXECUTIVE SUMMARY

**GRAND AVENUE
MAJOR INVESTMENT STUDY PHASE II
(SR 101L to McDowell Road)**

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

Grand Avenue (US 60) runs diagonally across the one-mile grid system of arterial streets that make up the roadway network in Phoenix's greater metropolitan area. Grand Avenue is oriented northwest/southeast and passes through the communities of Peoria, Glendale and Phoenix within the 12.5 mile Study Area from SR 101L to McDowell Road. Originally constructed in the late 1800's, Grand Avenue served as a major connection between the agricultural communities of the West Valley and the business community in downtown Phoenix. With the introduction of the railroad parallel to Grand Avenue, the West Valley continued to develop and began to transform from an agriculture-centered region to an industrial/agriculture-centered region. This change in land use and economic generators, along with the population growth that the West Valley began to experience, has led to increasing congestion along Grand Avenue, both in terms of motorized and non-motorized transportation.

In November 2004, the voters of Maricopa County passed Proposition 400, which extended the one-half cent sales tax designated for transportation improvements for another 20 years. The original tax, passed in 1985, has funded regional transportation improvements over the past two decades including eight grade separations along and across Grand Avenue. The Maricopa Association of Governments' (MAG's) Regional Transportation Plan (RTP), which provides guidance for revenues generated from the tax during the next 20 years, includes \$147 million for improvements to Grand Avenue within the Study Area. The purpose of this Study is to provide prioritized recommendations for these improvements. During development of the recommendations, consideration was given to pedestrian, bicyclist, transit and community mitigation projects in addition to traffic-related projects.

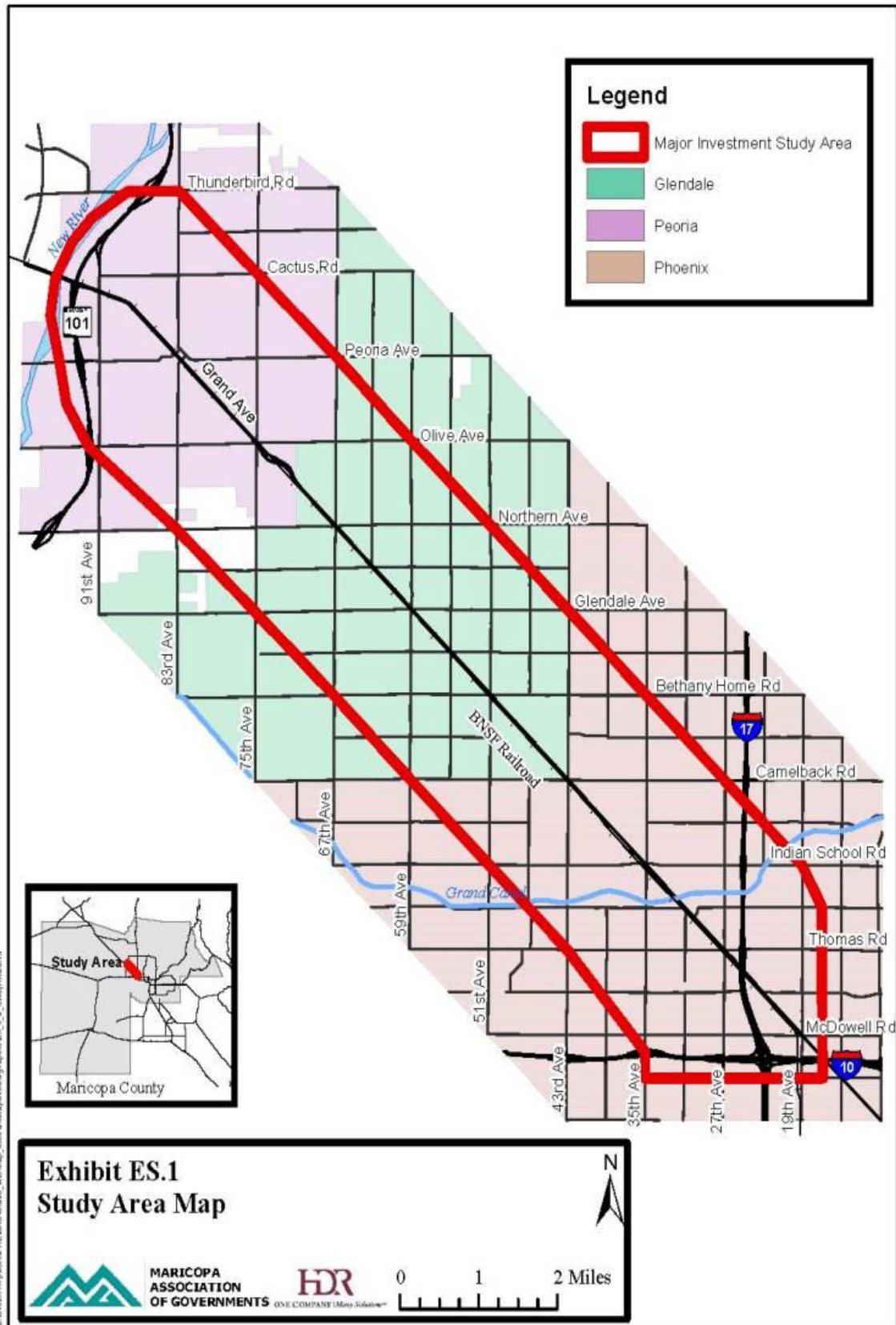
Several Agency Steering Group (ASG) forums were held during the study period to provide input into the issues and needs of the corridor and to review recommended improvements. Regular participants in the ASG forums included staff from the Cities of Glendale, Peoria and Phoenix as well as, Valley Metro, Federal Highway Administration (FHWA), Arizona Department of Transportation (ADOT), Maricopa County Department of Transportation (McDOT), and Burlington Northern Santa Fe Railway (BNSF). Two public meetings were held and attended by approximately 70 members of the public and other stakeholders. Fourteen individual meetings were held with various village planning committees and other stakeholders.

EXISTING CONDITIONS

The Grand Avenue corridor and Study Area is shown on Exhibit ES.1. Grand Avenue is a four-lane arterial from SR 101L to approaching 83rd Avenue and a six-lane arterial throughout the remainder of the Study Area. The diagonal orientation of Grand Avenue and the associated skewed intersections have resulted in excessive delays at north-south and east-west arterials. In addition, congestion is magnified by delays due to at-grade railroad crossings with the arterial streets.

Throughout the Study Area, a raised median typically separates directional traffic on Grand Avenue. Exclusive left-turn lanes are provided at most median breaks and intersections.

Exhibit ES.1 - Study Area Map



There are a total of 18 traffic signals (including the pair of signals at the SR 101L / Grand Avenue interchange) on Grand Avenue between SR 101L and McDowell Road. Traffic signal spacing varies from less than one-quarter mile to over one mile.

The right-of-way for Grand Avenue is generally 90 to 100 feet wide within the Study Area, but ranges from a minimum of 85 feet to a maximum of 166 feet.

Below is a summary of the existing roadway, railroad, and traffic conditions within the Study Area and the interrelationships of existing multi-modal elements.

Existing Roadway and Railroad Conditions

Grand Avenue

- Three travel lanes in each direction east of 83rd Ave with raised median
- Two travel lanes in each direction west of 83rd Ave with raised median
- Right-of-way width of 90 to 100 feet
- Access control at grade separations and on railroad side only
- 18 traffic signals along Grand Ave

BNSF

- Railway parallels Grand Ave
- Spur tracks cross Grand Avenue at one location south of Northern Ave

Major Six-Legged Intersections

- 19th Ave/ McDowell Rd/ Grand Ave
- 35th Ave/ Indian School Rd/ Grand (still operates as six-legged)

Grade Separations

- Grand Ave over 27th Ave / Thomas Rd
- Indian School Rd over 35th Ave / Grand Ave
- Grand Ave over 43rd Ave / Camelback Rd
- Olive Ave over 75th Ave / Grand Ave
- Maryland Ave over 55th Ave / Grand Ave
- 51st Ave over Bethany Home Rd / Grand Ave
- Grand Ave under 59th Ave / Glendale Ave (Under Construction as of March 2006)
- 67th Ave over Northern Ave / Grand Ave (Recently Completed)

Arterial Cross-Streets

- Typically three travel lanes Northbound and westbound
- Typically two travel lanes Southbound and eastbound
- Center two-way left-turn lane

Existing Traffic Conditions

Traffic Volumes

- 2002 volumes on Grand Avenue: 21,000 - 32,900 vehicles per day

Arterial Cross-Streets

- Capacity limited by at-grade crossings with Railroad

Congestion and Delay

- Six-legged intersections operate at LOS E or F during peak hours
- Train activity increases delay at some approaches by up to three minutes

Crashes

- Over 1,300 crashes on Grand Ave within Study Area in last three years

Existing Multi-Modal Elements

Transit Service

- Grand Avenue Limited serves 138 passengers per day and provides local bus service along Grand Avenue; its passenger per mile ratio is below the metropolitan average
- Transfer points at six-legged intersections are difficult for pedestrians; particularly those with disabilities
- Paratransit / vanpool service exist
- Three park-and-ride lots exist

Planned Improvements

- Increased local / express bus service
- Additional bike facilities

Other Facilities

- Existing bike facilities include bike lanes, bike routes and multi-use paths
- Six-legged intersections are difficult for pedestrians to cross because of long cross distances
- Sidewalks are not continuous within the Study Area

Intelligent Transportation Systems

- Grand Avenue and Northern Avenue are AZTech “SMART Corridors”
- Enhanced traffic detection, data collection and signal coordination will be implemented

Prior to the initiation of grade separated structures along the Grand Avenue corridor, most modifications to Grand Avenue had been modest over the past 25 years. The eight grade separations represented a major investment in Grand Avenue. In addition, major improvements have been made to the regional transportation network during this time period. A summary of the improvements and changes to the regional transportation network that affect travel on Grand Avenue is provided below:

- Eight grade separations along or across Grand Avenue.
- New traffic signal bridges at six-legged intersections along with operational improvements along Grand Avenue.
- The Agua Fria Freeway (SR 101L) has been completed from the Black Canyon Freeway (I-17) to the Papago Freeway (I-10). Ramps exiting northbound SR 101L and entering southbound SR 101L are provided for along Grand Avenue and are controlled by traffic signals. Ramps exiting southbound SR 101L and entering northbound SR 101L are provided for along 91st Avenue and operate as direct connection ramps.
- High Occupancy Vehicle (HOV) lanes and auxiliary lanes have been constructed along I-17 between Thomas Road and Peoria Avenue. The traffic interchanges along this stretch have also been reconstructed.
- Grand Avenue southeast of McDowell Road / 19th Avenue has been refurbished with new curb, gutter, sidewalk and landscaping and has been turned over to the City of Phoenix.

POPULATION AND PROJECTED TRAFFIC VOLUMES

The estimated 2006 population for the Study Area is nearly 148,000 people. The Study Area had a compounded annual growth rate of approximately 1.2 percent between 2000 and 2006. During the same period the Peoria, Glendale, and Phoenix Municipal Planning Areas are all estimated to have greater compounded annual growth rates of 6.0 percent, 3.5 percent, and 2.8 percent, respectively.

The Study Area is expected to grow seven percent in population to nearly 160,000 people by the year 2030. During the same period Peoria's population is projected to increase nearly 80 percent, followed by Phoenix with 40 percent growth, and then Glendale, which is anticipated to experience 17 percent growth.

These figures were used in updating MAG's traffic demand forecasting, which was used to determine needs and evaluate the recommended improvements. A comparison between the 2002 Average Daily Traffic (ADT), the 2030 Base ADT, and the 2030 Plan ADT is shown in Exhibit ES.2 below.

Exhibit ES.2 - Grand Ave - Traffic Volumes (Two-Way ADT)

Section	2002 ADT	2030 Base ADT	2030 Plan ADT
SR 101L – 91 st Ave	24,600	43,100	43,500
91 st Ave – 83 rd Ave	23,000	35,700	35,500
83 rd Ave – 75 th Ave	21,000	45,300	45,700
75 th Ave – 67 th Ave	23,000	44,400	41,100
67 th Ave – 59 th Ave	24,000	48,300	60,100
59 th Ave – 51 st Ave	26,000	48,500	58,700
51 st Ave – 43 rd Ave	22,300	46,400	55,800
43 rd Ave – 35 th Ave	29,000	57,500	66,500
35 th Ave – 27 th Ave	32,900	51,400	61,400
27 th Ave – 19 th Ave	21,700	31,700	38,900
Note: 2030 base system includes the eight grade separations from the original MIS; 2030 plan system includes improvements identified in this study, as well as future Northern Parkway.			

ENVIRONMENTAL CONSIDERATIONS

Environmental Justice

Environmental justice analysis included identifying the population and distribution of demographic information such as: minorities, the elderly, persons with disabilities, female heads of household (with own children), poverty, vehicle availability, and educational attainment, as well as a metric that considered the cumulative number of these factors for a geographic area.

The following points highlight the environmental justice populations identified within the Study Area:

- The minority population in the Study Area is 56 percent, compared to Maricopa County which has a minority population of 34 percent.
- Hispanics comprise 80 percent of the minority population in the Study Area.
- Three-quarters of the Census Tracts that make up the Study Area exceed the County average for female heads of households with own children under 18 years of age.
- Three-quarters of the Census Tracts that make up the Study Area exceed the County average for households in poverty.
- Vehicle availability for households is a problem throughout the Study Area; with the percentage of households with no vehicle available (13 percent) nearly double that of Maricopa County.
- The percent of the Study Area population without a high school diploma (32 percent) is nearly double that of Maricopa County overall.

Twenty-two of the twenty-seven Census Tracts that comprise the Study Area have five or more environmental justice populations above the County average. It is anticipated that transportation improvement projects within the corridor will serve and benefit the residents regardless of their census population classification. Further evaluation will be conducted as part of ADOT's project-level design concept report process.

Hazardous Materials

Due to the number of listed hazardous sites, an initial site assessment (ISA) should be conducted when future projects are identified that may affect listed hazardous sites. The ISA would confirm or deny the presence of hazardous materials at specific locations.

Historic 4(f) Properties

There are a total of nine sites previously recorded that are listed on the National Register of Historic Places (NRHP) within the Study Area. When future projects are identified that may affect historic properties that are NRHP listed or eligible, avoidance may be recommended. Mitigation of construction impacts through testing and data recovery may be considered as necessary.

ISSUES AND NEEDS IDENTIFICATION

A number of issues concerning the Grand Avenue corridor were identified in the scope of work for the study, through consultation and through technical analyses. Consultation included discussions with the ASG and stakeholders for the corridor, input received at public meetings, and review of the previous 23 studies or reports related to the Grand Avenue corridor. From this review and consultation, 14 issues were identified:

- 1) Connectivity to I-10, I-17, and SR 101L
- 2) Route Transfer
- 3) Ultimate Concepts (Roadway, Transit, Bicycle, Pedestrian, and Community Mitigation)
- 4) Grade Separations
- 5) Intersection Improvements (including skewed & offset intersections)
- 6) Intelligent Transportation Systems (ITS) and signals
- 7) Bottlenecks
- 8) Access Management (including medians and local access needs)
- 9) Safety
- 10) Bicycle and Pedestrian Requirements
- 11) Transit Requirements
- 12) Goods Movement
- 13) Community Mitigation
- 14) Drainage

The study process addressed all of these areas in detail and findings are described in the Final Report. However, study recommendations for funding by the MAG RTP Highway Program are focused on grade separations, intersection improvements, access management, and community mitigation. It is anticipated that funding for other project areas will be addressed specifically by those modal programs.

FUNDING

In 2003, the MAG RTP Highway Program identified \$147 million of funding for Grand Avenue between SR 101L and Van Buren Street. For purposes of this study, the funding was adjusted to \$151.7 million, which includes 2005 cost estimates for the three grade separations identified for this segment in the RTP and inflation of the remaining funding from 2002 to 2005 dollars.

The revised funding allocation by phase is shown below:

- Phase 1 (2006 to 2010) - \$31.1 Million
- Phase 2 (2011 to 2015) - \$21.0 Million
- Phase 3 (2016 to 2020) - \$0.0
- Phase 4 (2021 to 2025) - \$99.6 Million

There were three specific projects identified in the MAG RTP to be constructed in Phase 4 of the RTP. The three projects were:

- A grade separation at the 51st Avenue/Bethany Home Road intersection
- A grade separation at the 35th Avenue/Indian School Road intersection
- A grade separation at the 19th Avenue/McDowell Road intersection

Updated estimates for the three grade separations total \$89.2 million (2005 dollars) of the \$99.6 million available in the revised Phase 4 funding estimate. The remaining funding; \$31.1 million in Phase 1, \$21.0 million in Phase II and \$10.4 million in Phase 4, was identified for additional improvements along Grand Avenue. In addition to this funding, the City of Glendale has approximately \$10 million available to contribute to Phase 1 access management and community mitigation projects within the Glendale City boundaries.

An alternative approach to identifying a funding target was raised during the study process. This methodology would inflate the original \$147 million by an annual rate (3% was suggested) to yield a total of \$160.6 million in 2005 dollars, as opposed to the \$151.7 million arrived at above. The \$151.7 million was used in the study process, because it is more conservative and because the overall approach to cost increases and inflation has not yet been finalized for the ADOT Freeway/Highway Life Cycle Program.

The recommendations covered in this study are directed at the \$151.7 million in estimated funding and are described in detail below. A number of other potential projects identified in the Study process may be funded from other MAG RTP funding sources including the Streets, Transit, Pedestrian, Bicycle, and ITS programs. Additional projects beyond the 20-year planning period and projects potentially funded by other modal sources are shown in Appendix G of the Final Report.

RECOMMENDED IMPROVEMENTS

The following recommendations were derived from information developed during the study process, including input from members of the ASG and the public. A major objective in developing the detailed recommendations was to improve traffic flow along and across

Grand Avenue. The recommended plan addresses four of the most important issues and needs as identified by the ASG, including:

- Grade Separations
- Intersection Improvements
- Access Management
- Community Mitigation

GRADE SEPARATIONS

There were five grade separation projects identified in the study process. Two of the five were considered in the study process but not recommended for funding under the RTP Highway Program. These two grade separations are detailed below.

- Northern Parkway Directional Ramps at Grand Avenue and 67th Avenue - project is currently identified in the arterial street portion of the MAG RTP and, therefore, not recommended for Highway Program funding.
- Grand Avenue Under Peoria Avenue and 83rd Avenue – completion of the project determined to be beyond 20-year planning period. Improvements to 83rd Avenue/Grand Avenue and Peoria Avenue/Grand Avenue intersections are recommended for funding as an Intersection Improvement. Additional discussions with Peoria staff should occur as part of a future ADOT design concept report to develop detailed improvement plans, which might include phasing for a potential future grade separation.

The remaining three grade separations are recommended for full funding as shown below.

- Bethany Home Road Under Grand Avenue and 51st Avenue – recommended for full funding in Phase 4 of the MAG RTP Highway Program (as identified in the *Grand Avenue Limited Expressway Design Concept Study in the Glendale Area, 2003 (Grand Avenue DCR)*).
- Grand Avenue Under Indian School Road and 35th Avenue – recommended for full funding in Phase 4 of the MAG RTP Highway Program.
- 19th Avenue Over Grand Avenue and McDowell Road – recommended for full funding in Phase 4 of the MAG RTP Highway Program.

Grand Avenue/Bethany Home Road/51st Avenue

Bethany Home Road Under Grand Avenue and 51st Avenue is the preferred configuration for this intersection as identified in the *Grand Avenue Limited Expressway Design Concept Study in the Glendale Area, 2003 (Grand Avenue DCR)*.

Grand Avenue/Indian School Road/35th Avenue

Grand Avenue Under 35th Avenue and Indian School Road is the preferred configuration for this intersection. Even though Indian School Road is currently grade separated, the existing intersection still operates as a six-legged intersection because of allowed left-turn movements. The Grand Avenue Underpass eliminates the six-legged intersection and the Grand Avenue signal, provides a greater Level of Service (LOS), and provides continuity

with the Grand Avenue Overpass at 27th Avenue/ Thomas Road to the south and the Grand Avenue Overpass at 43rd Avenue/Camelback Road to the north.

Grand Avenue/McDowell Road/19th Avenue

Nineteenth Avenue Over Grand Avenue and McDowell Road is the preferred configuration for this intersection. The 19th Avenue Overpass provides greater service benefits than the 19th Avenue Flyover Ramps by eliminating the six-legged intersection and providing a greater LOS for existing traffic; however it could have greater impact to businesses and the historic neighborhood north of McDowell Road.

INTERSECTION IMPROVEMENTS

Within the Study Area, Grand Avenue is host to over 60 three-, four-, five- and six-legged intersections that are either stop controlled or signal controlled. Of the 60-plus intersections, approximately 65 percent are skewed. The remaining intersections have been reconstructed into perpendicular intersections or as grade separations.

The study team identified five potential candidates for intersection improvements. Of the five intersections, the 31st Avenue/Osborn Road intersection and the 19th Avenue dual left-turn lanes are recommended for funding with MAG RTP Highway funds. The remaining three intersection improvements could be pursued in the future if additional funding sources are identified.

Two additional intersections were identified following completion of the alternatives analysis phase of the study and are recommended for improvement. The first is the Grand Avenue intersection with Peoria Avenue and 83rd Avenue in downtown Peoria. The close proximity of the two traffic signals contributes to congestion in the downtown area. The second is the intersection of Grand Avenue with Myrtle Avenue in downtown Glendale. Additional traffic volume from Northern Parkway coupled with opening of the Grand Avenue underpass will create the need for additional capacity at Myrtle Avenue. The proposed solution is to provide SE bound dual left-turn lanes from Grand Avenue to Myrtle Avenue and to widen Myrtle Avenue from 59th Avenue to 62nd Avenue. The dual left-turn lane improvements on Grand Avenue are recommended for RTP Highway Program funds, while improvements to Myrtle Avenue itself, will require other funding sources. The latter improvements are listed in Appendix G of the Final Report, which covers projects beyond the 20-year planning period and projects potentially funded by other sources.

Grand Avenue/Peoria Avenue/83rd Avenue

The existing intersection configuration currently has two signals spaced approximately 600 feet apart along Grand Avenue. The northernmost intersection is a four-legged perpendicular intersection including Grand Avenue and Peoria Avenue. The southernmost intersection is a four-legged perpendicular intersection including Grand Avenue and 83rd Avenue. Potential improvements to the intersections could include parcel purchase and access reconfiguration, installation of community mitigation features, installation of pedestrian facilities, right-of-way acquisition and intersection reconfiguration. Additional discussions with City of Peoria

staff should be planned as part of a future ADOT design concept report to develop detailed improvement plans, which might include phasing for a potential grade separation.

Grand Avenue/Myrtle Avenue SE bound Dual Left-Turn Lanes

Myrtle Avenue has been designated as a gateway street to downtown by the City of Glendale. Due to expected increases in traffic on gateway streets, the City of Glendale has developed conceptual plans to improve the connection to Grand Avenue. To implement the improvements, Grand Avenue would be widened north and south of Myrtle Avenue to add the SE bound dual left-turn lane. The City proposes to exchange right-turn lanes at Myrtle Avenue originally identified in this study for the additional left-turn lane. These changes have been reflected in the study recommendations (Exhibits ES.3-ES.6). The conceptual plan includes the need for additional R/W along the north and east side of Grand Avenue.

31st Avenue/Osborn Road

The existing intersection configuration currently has two signals spaced approximately 900 feet apart along Grand Avenue. The northernmost intersection is a five-legged skewed intersection including Grand Avenue, 31st Avenue and Osborn Road to the west. The southernmost intersection is a three-legged perpendicular intersection including Grand Avenue and Osborn Road to the east. The recommended realignment would eliminate one of the signals and create a perpendicular four-legged intersection.

19th Avenue Dual Left-Turn Lanes

The existing Grand Avenue/19th Avenue/McDowell Road intersection experiences high left-turns in the peak periods. Comments from the ASG identified a project to construct dual left-turn lanes on 19th Avenue to alleviate some of the delays for travelers trying to access Grand Avenue from northbound 19th Avenue. Therefore, funding a portion of this project with MAG RTP Highway funds is recommended. Since this would be an interim project until the 19th Avenue overpass is constructed, it is recommended as a Phase 1 project.

ACCESS MANAGEMENT AND COMMUNITY MITIGATION

One of the main goals of the ASG was to build upon the improvements identified in the original *Grand Avenue MIS* and move Grand Avenue toward the status of an Enhanced Arterial/ Limited Expressway. The steering group identified access management as the prime method to achieve this goal. Access management strategies recommended for consideration in this study include:

- Closing select median crossovers to reduce turning movements across Grand Avenue.
- Reconfiguring minor collector intersections to right-in/right-out.
- Removing unused driveways and curb cuts.
- Constructing right-turn only and auxiliary lanes to remove the turning traffic from the through lanes of Grand Avenue.
- Potentially constructing frontage roads.
- Purchasing groups of parcels impacted by the addition of auxiliary lanes and reconfiguring access to streets other than Grand Avenue.

As noted previously, the ASG identified the need to mitigate the impacts of the corridor on the surrounding community. Community mitigation features that are directly associated with

the auxiliary and right-turn lanes include landscaping, pedestrian access, street lighting, utility undergrounding and screen walls. Details of specific design features, such as, landscape buffer widths, sidewalk widths, wall heights, etc., will be addressed by ADOT in a future design concept report. The access management and community mitigation improvements recommended for RTP Highway Program funding are shown in Exhibit ES.3.

Exhibit ES.3: Access Management and Community Mitigation Improvements

Segment	Access Management Improvements (RTP Phase)	Community Mitigation Improvements (RTP Phase)	Notes
SR 101L to 91 st Ave	<ul style="list-style-type: none"> • No recommended improvements 	<ul style="list-style-type: none"> • No recommended improvements 	Improvements identified as part of ADOT project, Grand Ave. – 83 rd Ave. to 99 th Ave.
91 st Ave to 83 rd Ave	<ul style="list-style-type: none"> • Auxiliary Lane and related items – 91st Ave. to 89th Ave., 88th Dr. to 83rd Ave. (2) • 4 driveway closures (2) 	<ul style="list-style-type: none"> • Non-RR side Landscaping (1) • Non-RR side Sidewalk (1) • Non-RR side Screen wall (1) • Median Landscaping (1) • RR-side Landscape/Barrier (4) • Street Lighting (both sides) (1) • Utility Undergrounding – 87th Ave. to 86th Ave. (2) 	No driveways from 89 th Ave. to 88 th Dr.. Working with Peoria, the ADOT DCR process may address a range of access and community mitigation options, including frontage roads and/or pedestrian access.
83 rd Ave to 75 th Ave	<ul style="list-style-type: none"> • No recommended improvements 	<ul style="list-style-type: none"> • Non-RR side Landscaping (1) • Non-RR side Sidewalk (1) • Non-RR side Screen wall (1) • Median Landscaping (1) • RR-side Landscape/Barrier (4) • Street Lighting (both sides) (1) • Utility Undergrounding – 83rd Ave. to 82nd Ave. (1) 	Existing landscaping on non-RR side from Mountain View Rd. to 79 th Ave., some existing median landscaping
75 th Ave to 67 th Ave	<ul style="list-style-type: none"> • Parcel purchase and access reconfiguration – north of Northern fronting Grand Avenue (1) 	<ul style="list-style-type: none"> • Street Lighting (both sides) (1) 	Improvements from 71 st Ave. to Royal Palm Dr. not recommended for funding in the 20-year planning period.
67 th Ave to 59 th Ave	<ul style="list-style-type: none"> • Parcel purchase and access reconfiguration - 67th Ave. to 65th Ave., 65th Ave. to 63rd Ave., NE corner of 61st Ave. & Myrtle Ave. (1) • Reconfigure Access – NE and SE corner, Orangewood Ave. & 63rd Ave. (1) • Rt-in/Rt-out – Orangewood Ave., 63rd Ave. (1) • 7 driveway closures (1) • 2 median closures – Orangewood Ave./63rd Ave. & 62nd Ave. (1) • 1 Rt. Turn Lane – Mobile Manor (1) 	<ul style="list-style-type: none"> • Non-RR side Landscaping (1) • Non-RR side Sidewalk (1) • Non-RR side Screen wall (1) • Median Landscaping (1) • RR-side Landscape/Barrier (4) • Street Lighting (both sides) (1) • Utility Undergrounding – 67th Ave. to Palmar Ave. (1) 	Full-length improvements end at 60 th Ave. due to existing Grand Ave. underpass improvements.

Exhibit ES.3 (Cont): Access Management and Community Mitigation Improvements

Segment	Access Management Improvements (RTP Phase)	Community Mitigation Improvements (RTP Phase)	Notes
59 th Ave to 51 st Ave	<ul style="list-style-type: none"> Parcel purchase and access reconfiguration - 57th Dr. to 57th Ave., parcel west of 51st Ave overpass (1) Remove Access – 57th Ave. and Ocotillo Rd. (1) Rt.-in/Rt.-out – 56th Ave. (1) Median closure – 56th Ave. (1) 2 Auxiliary Lanes – 53rd Ave. to 52nd Ave. (1); 55th Ave. to 56th Ave. (1) 21 driveway closures (1) 	<ul style="list-style-type: none"> Non-RR side Landscaping (1) Non-RR side Sidewalk (1) Non-RR side Screen wall (1) Median Landscaping (1) RR-side Landscape/Barrier (4) Street Lighting (both sides) (1) 	Full-length improvements begin at 57 th Dr. due to existing Grand Avenue underpass improvements.
51 st Ave to 43 rd Ave	<ul style="list-style-type: none"> Rt.-in Rt.-out – Missouri Ave. (1) Auxiliary Lane – Missouri Ave. to on-ramp (1) 4 median closures – 3 in front of school and basin, 1 at 47th Ave. & Missouri Ave. (1) 3 driveway closures (1) 	<ul style="list-style-type: none"> Non-RR side Landscaping (1) Non-RR side Sidewalk (1) Non-RR side Screen wall (1) Median Landscaping (1) RR-side Landscape/Barrier (4) Street Lighting (both sides) (1) 	Full length improvements end at 43 rd Ave. on-ramp due to existing Grand Ave. overpass improvements.
43 rd Ave to 35 th Ave	<ul style="list-style-type: none"> 4 median closures – 40th Ave., near 39th Ave., 37th Ave., near 36th Ave. (1) Rt.-turn lane – 39th Ave. (1) Rt.-in/Rt.-out – 37th Ave. (1) 23 driveway closures (1) 	<ul style="list-style-type: none"> Sidewalk Only – 41st Ave. to 36th Ave. (1) Median Landscaping (1) RR-side Landscape/Barrier (4) Street Lighting (both sides) (1) Utility Undergrounding – 41st Ave. to Indian School Road (2) 	Full length improvements begin at 43 rd Ave. off-ramp due to existing Grand Ave. overpass improvements and end at Indian School Rd. on-ramp. Other improvements identified but not recommended in the 20-year planning period due to funding constraints.
35 th Ave to 27 th Ave	<ul style="list-style-type: none"> Parcel purchase & access reconfiguration – SW corner 31st Ave./Grand Ave. (2) 2 Rt.-turn lanes – 33rd Ave., realigned Osborn Rd (1) Rt.-in/Rt.-out – 31st Ave. (1) 2 median closures – near canal crossing, 31st Ave. (1) Remove Rd. – Osborn (1) 12 driveway closures (1) 	<ul style="list-style-type: none"> Sidewalk Only – 29th Ave. to Weldon Ave. (1) Median Landscaping (1) RR-side Landscape/Barrier (4) Street Lighting (both sides) (1) Utility Undergrounding – 35th Ave. to 31st Ave., Osborn Rd. to NW bound on-ramp (2) 	Other improvements identified but not recommended for funding in the 20-year planning period due to funding constraints.
27 th Ave to 19 th Ave	<ul style="list-style-type: none"> Reconfigure access – 21st Ave. to 20th Ave. (1) 4 Rt.-in/Rt.-out – 24th Ave., Monte Vista, 21st Ave., 20th Ave. (1) Rt.-turn lane – Encanto (1) 5 median closures – 24th Dr., 24th Ave., Monte Vista, 21st Ave., 20th Ave. (1) 21 driveway closures (1) 	<ul style="list-style-type: none"> Sidewalk Only – 24th Ave. to 24th Dr. (1) Median Landscaping (1) RR-side Landscape/Barrier (4) Street Lighting (both sides) (1) Utility Undergrounding – north of Encanto Blvd. to south of Monte Vista Rd. (2) 	<p>Full length improvements begin at 24th Dr. due to existing Grand Ave. overpass improvements.</p> <p>Other improvements identified but not recommended for funding in the 20-year planning period due to funding constraints.</p>
<p>General Notes: 1) If limits for each specific improvement are not shown, it can be assumed that the improvements extend for the entire limits. 2) All community mitigation improvements should be maintained by local forces. 3) Improvements identified between 91st Ave. and 83rd Ave. should be coordinated with ADOT's Grand Ave. widening project to identify potential installation of low-cost items related to improvements in this study.</p>			

IMPLEMENTATION PLAN

The study team evaluated a broad range of projects for the corridor and narrowed down the list to those recommended in the previous section. An implementation plan for the recommended projects was developed with respect to the phased funding constraints identified in the MAG RTP Highway Program. The Phase 1, 2 and 4 implementation plans with estimated program costs are shown in Exhibits ES.4 through ES.6. Phase 3 of the MAG RTP Highway Program has no money programmed for Grand Avenue improvements within the Study Area; therefore an implementation plan is not shown for this phase. Below is a summary of the estimated funding available by phase.

<u>MAG RTP Highway Program</u>	<u>Millions</u>
Phase 1	\$31.1
Phase 2	\$21.0
Phase 4	<u>\$99.6</u>
Total RTP Funding Available	\$151.7
City of Glendale Funding	\$10.0

Note: The total estimated cost of the recommended projects is equal to the total funding projected to be available. Slight differences in available funding versus cost by phase can be addressed by the future cash flow management process. The access management and community mitigation improvements referenced in Exhibits ES.4 through ES.6 are described in further detail in Exhibit ES.3.

Exhibit ES.4: Phase 1 (2006-2010) Recommended Implementation Plan

Segment	Item of Work	Estimated 2005 Cost
91 st Ave to 83 rd Ave	Access Management and Community Mitigation Improvements	\$941,000
83 rd Ave to 75 th Ave	Access Management and Community Mitigation Improvements	\$1,706,000
75 th Ave to 67 th Ave	Access Management and Community Mitigation Improvements	\$1,514,000
67 th Ave to 59 th Ave	Access Management and Community Mitigation Improvements	\$15,584,000
59 th Ave to 51 st Ave	Access Management and Community Mitigation Improvements	\$7,239,000
51 st Ave to 43 rd Ave	Access Management and Community Mitigation Improvements	\$6,166,000
43 rd Ave to 35 th Ave	Access Management and Community Mitigation Improvements	\$1,844,000
35 th Ave to 27 th Ave	Access Management and Community Mitigation Improvements	\$1,222,000
27 th Ave to 19 th Ave	Access Management and Community Mitigation Improvements	\$2,029,000
Grand Ave / Myrtle Ave	Intersection Improvements (SE bound Dual Left-Turn Lanes)	\$1,219,000
19 th Ave / McDowell Rd	Intersection Improvements	\$1,472,000
	Total Phase 1 2005 Cost Estimate	\$40,936,000
	Estimated MAG RTP Highway Program Phase 1 Funding Available	\$31,100,000¹
	City of Glendale Funding Available	\$10,000,000
¹ – Phase 1 money not available until FY 2010		

Exhibit ES.5: Phase 2 (2011-2015) Recommended Implementation Plan

Segment	Item of Work	Estimated 2005 Cost
91 st Ave to 83 rd Ave	Access Management and Community Mitigation Improvements	\$8,774,000
43 rd Ave to 19 th Ave	Access Management and Community Mitigation Improvements	\$5,249,000
31 st Ave / Osborn Rd	Intersection Improvements	\$7,250,000
	Total Phase 2 2005 Cost Estimate	\$21,273,000
	Estimated MAG RTP Highway Program Phase 2 Funding Available	\$21,000,000

Exhibit ES.6: Phase 4 (2021-2025) Recommended Implementation Plan

Segment	Item of Work	Estimated 2005 Cost
91 st Ave to 19 th Ave	Access Management and Community Mitigation Improvements	\$5,353,000
Peoria Ave / 83 rd Ave	Intersection Improvements ¹	\$5,000,000
51 st Ave / Grand Ave	Bethany Home Road Underpass	\$32,694,000
35 th Ave / Indian School	Grand Avenue Underpass	\$37,472,000
Grand Ave / McDowell Rd	19 th Avenue Overpass	\$18,972,000
	Total Phase 4 2005 Cost Estimate	\$99,491,000
	Estimated MAG RTP Highway Program Phase 4 Funding Available	\$99,600,000
¹ – Detailed plans should be developed as part of future design concept report, in association with City of Peoria staff.		